

A DESCRIPTION OF A NEW SPECIES OF
MACROBRACHIUM FROM PERÚ, AND DISTRIBUTIONAL
RECORDS FOR *MACROBRACHIUM BRASILIENSE* (HELLER)
(CRUSTACEA: DECAPODA: PALAEMONIDAE)

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Abstract. — A systematic study is made on a collection of freshwater shrimps (Palaemonidae) from northern Perú collected by Dr. R. W. McDiarmid during the years 1977–1980. A new species is described *Macrobrachium depressimanum*, and *Macrobrachium brasiliense* (Heller) is reported. The diversity of palaemonids in the Amazon region is discussed.

Resúmen. — Se realiza un estudio sistemático sobre una colección de camarones de agua dulce del norte del Perú, colectados por el Dr. R. W. McDiarmid durante los años de 1977 y 1980. Se describe una nueva especie, *Macrobrachium depressimanum*, y se reporta la especie *Macrobrachium brasiliense* (Heller). Se discute acerca de la alta diversidad de camarones palaemónidos en la región del Amazonas.

The present work is based on collections made primarily by Dr. R. W. McDiarmid in northern Perú during 1977 and 1980. The specimens were collected during field research in ethnobiological anthropology, conducted in the region of the Alto Marañón River by scientists from the University of California. The collection has many samples of two species of the freshwater shrimp genus *Macrobrachium* Bate, 1868 and several species of crabs of the families Trichodactylidae and Pseudothelphusidae. Only the shrimps are reported in this paper. Descriptions are based on adult males. Total length (TL) is taken from the tip of the rostrum to the posterior border of telson. Carapace length (CL) is taken from the ocular margin to the posterior border of carapace. Only partial synonymy is given for *M. brasiliense* (Heller, 1862). All material is deposited in the National Museum of Natural History, Smithsonian Institution, Washington D.C., U.S.A. (USNM).

Macrobrachium depressimanum,
new species
(Figs. 1, 2)

Type material. — *Holotype*, 1 ♂, USNM 230032, 35.5 mm (TL), 6.2 mm (CL), Perú, Amazonas Department, Santiago River, La Poza, 4°01'S, 77°47'W, 26 Jan 1980, coll. R. W. McDiarmid. *Paratypes*, 2 ♀ (1 ovig.), USNM 230030; 4 ♀ (2 ovig.), 14 ♂, USNM 230031 (locality and date, same as for holotype).

Additional material examined. — 108 ♀, 133 ♂, from the following localities in Perú: Amazonas Department, Santiago River, La Poza, 4°01'S, 77°47'W; Caterpiza River, 3°55'S, 77°42'W; Cenepa River near Huampami, 4°28'S, 78°10'W; Santiago River at Pinglo, at confluence between Santiago River and Marañón River, 4°26'S, 77°39'W; Marañón River across from Santa María de Nieva, and at confluence of Nieva River with Marañón River, 4°35'S, 77°77'W;

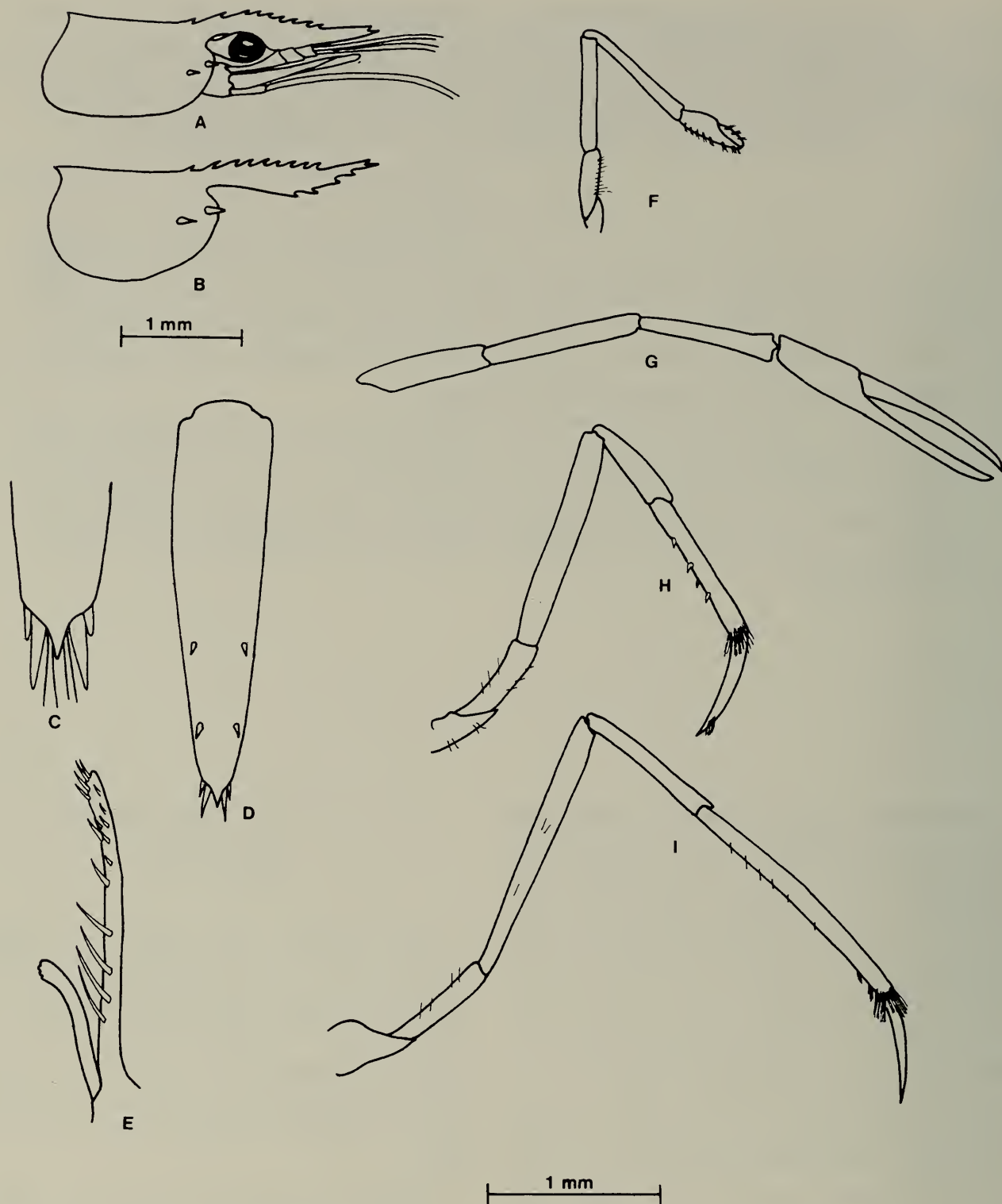


Fig. 1. *Macrobrachium depressimanum*, new species. A, carapace and cephalic appendages; B, carapace; C, posterior region of telson; D, telson; E, appendix masculina and appendix interna; F, first pereiopod; G, second pereiopod; H, third pereiopod; I, fifth pereiopod.

Ucayalí, Tahualló River, Pucalpa, 8°23'S, 74°32'W; Ucayalí, Tahualló River, Pucalpa, Neshuya, 8°23'S, 74°32'W; Madre de Dios, Tambopata Natural Reservoir, La Torre River, 11°58'S, 69°11'W.

Diagnosis—Adult males with second pe-

reopod smooth; ratio palm length/finger length about 0.6; palm flattened anterodorsally (Fig. 1G).

Description.—Rostrum nearly straight, slightly arched over eyes, reaching (or slightly overreaching) distal border of scapho-

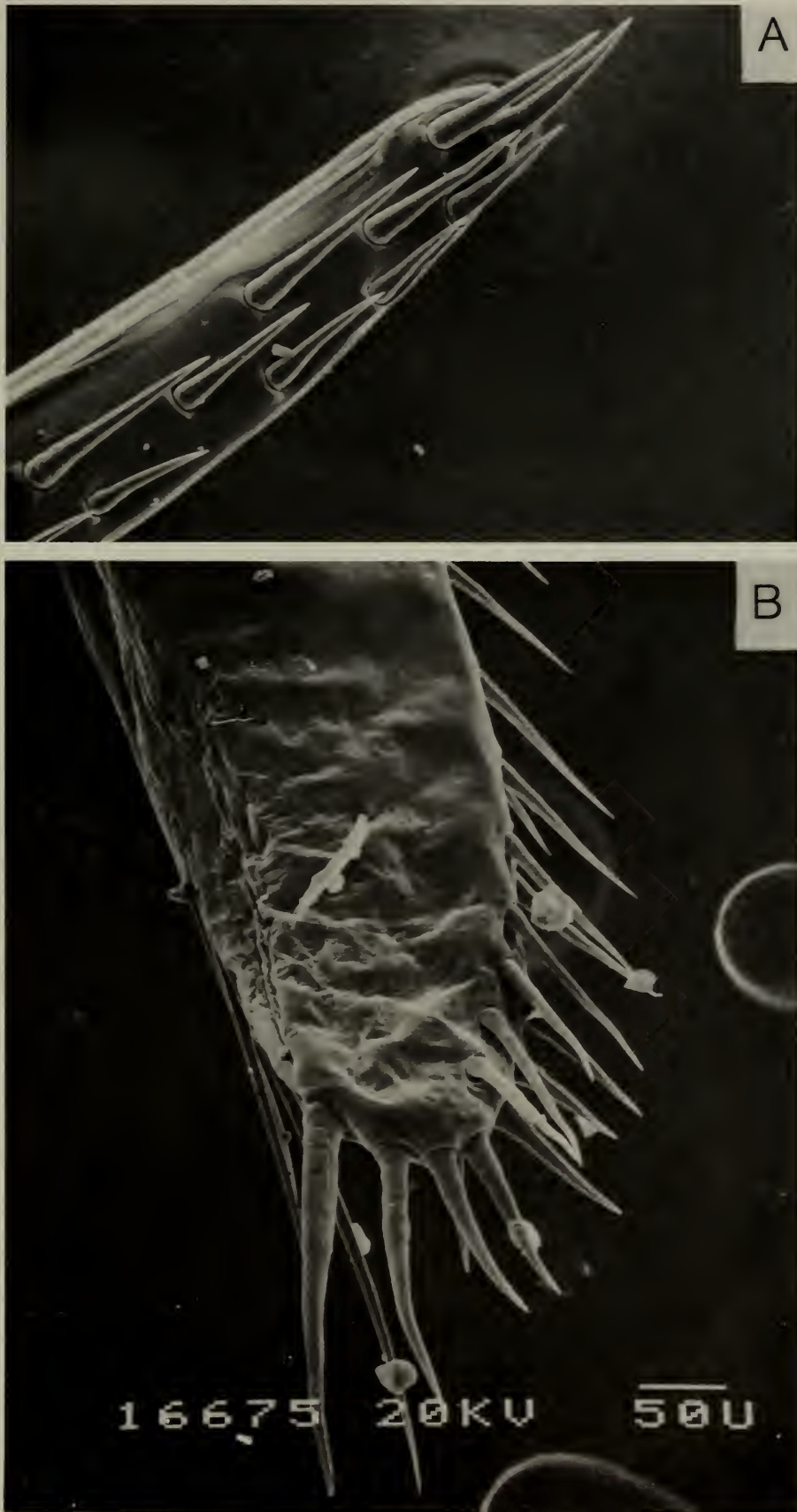


Fig. 2. Detail of appendix masculina. A, *Macrobrachium depressimanum*, new species, anterior view; B, *Macrobrachium jelskii* (Miers, 1877), lateral view. Same scale for A and B.

rite with apex, tip pointing upwards. Upper border bearing 11 (9–11 in paratypes) teeth, 2 proximal teeth more spaced behind the orbit. Lower margin bearing 5 (4–6 in paratypes) teeth (Fig. 1A, B). Carapace smooth. Scaphocerite 2.5 times longer than wide. Abdomen smooth, posteroventral angle of fifth pleuron acute; sixth abdominal segment 1.5 times length of fifth, same length as telson. Telson with 2 pairs of dorsal spines situated at $\frac{1}{6}$ and $\frac{1}{3}$ its length from base. Posterior margin, tapering abruptly to median apex bearing 2 pairs of lateral spines. Inner pair of spines overreaching median apex. Four plumose setae present on posterior margin between inner spines (Fig. 1C, D). First pereopods slenderer than second pair, reaching scaphocerite with tips of fingers; palm cylindrical, 0.9 times length of dactyl. Carpus 3.1 times length of palm, 1.1 times that of merus (Fig. 1F). Second pair of pereopods equal, smooth, reaching anterior border of scaphocerite with distal carpus. Fingers thin, closing over entire length of chela, without conspicuous teeth. Palm flattened anterodorsally, 2.1 times longer than high, 0.6 times length of dactyl. Carpus 1.5 times length of palm, 0.9 times that of merus (Fig. 1G). Third pair of pereopods failing to reach distal border of scaphocerite. Propodus with longitudinal row of 4 spines on inner margin, 1.3 times length of dactyl, 1.7 times that of carpus (Fig. 1H). Fifth pair of pereopods reaching distal border of scaphocerite with tip of dactyl. Propodus with longitudinal row of 6 spines on inner margin, 2 times length of dactyl, 1.7 times length of carpus (Fig. 1I). Appendix masculina 2.1 times longer than appendix interna (Fig. 1E), with acute apex, and 18 short, smooth spines.

Fecundity.—One ovigerous female, TL = 38 mm, CL = 7.1 mm, with 23 eggs, 1.2 mm largest diameter.

Distribution.—Dr. Célio Magalhaes from Instituto Nacional de Pesquisas da Amazonia (INPA), Brazil, has informed me that

there are specimens of this species in the invertebrate collection of his Institute, from the following localities in Brazil: Amazonas State, Tefé River, Solimoes, 3°35'S, 64°47'W; Solimoes River, Catalao coast, near Manaus, 3°8'S, 60°1'W; Acre State, Tarauacá River, Tarauacá, 6°42'S, 69°48'W; Rondonia State, Madeira River, fall of Teotônio, 3°22'S, 58°45'W; Mamoré River, near Guajará-Mirim, 10°23'S, 65°23'W; Madeira River, near Guajará-Mirim, 10°23'S, 65°23'W. Based on these data the species is distributed over the upper Amazon Basin, from Perú to northeastern Brazil.

Etymology.—The specific name is derived from a composite of the Latin words *depressus* meaning dorsoventrally flattened and *manus* meaning hand. It stresses the typical shape of the anterior part of the palm in this species.

Remarks.—The present species is morphologically related to *Macrobrachium jelskii* (Miers, 1877). *M. depressimanum* has more teeth on the dorsal border of the rostrum. The formula for *M. jelskii* is 6–9 (1 post-ocular) whereas it is 10–12 (2 post-ocular) in *M. depressimanum*. The relative proportion of segments in the second pereopods is very distinctive, the ratio between palm length/dactyl length is 0.6 in *M. depressimanum* whereas it is 1.5 in *M. jelskii*. The anterodorsally flattened shape of the palm is a typical feature of *M. depressimanum*.

The shape of the appendix masculina is not of common usage in the taxonomy of *Macrobrachium*. However, the appendix masculina of *M. depressimanum* is very distinctive. It is 2.1 times longer than the appendix interna, whereas in *M. jelskii* it is about 1.5 times longer. The appendix interna of *M. depressimanum* is also more slender compared to that of *M. jelskii* (Fig. 2). The two species are allopatric but there is a possibility of some overlap since *M. jelskii* was reported by Holthuis (1966) as occurring in north-east Brazil.

Macrobrachium brasiliense (Heller, 1862)

Palaemon brasiliensis.—Heller, 1862:419.

Macrobrachium brasiliense.—Holthuis, 1952:79, pl. 19.—Holthuis, 1959:93.—Rodríguez, 1982:382.

Material examined.—63 ♀, 114 ♂, 112 juveniles, from the following localities in Perú, Amazonas Department: Santiago River, La Poza, 4°01'S, 77°47'W; Castillo Creek (mouth enters Santiago River at 1.5 km south of La Poza), 4°02'S, 77°47'W; at Pinglo, confluence at Santiago River and Marañón River, 4°26'S, 77°39'W; way to Galilea, creek in the forest, 4°15'S, 77°49'W; Galilea, 4°01'S, 77°49'W; Yutapis River, Shiringa, 4°01'S, 77°51'W; Caterpiza River, 3°55'S, 77°43'W; Cenepa River, 3°55'S, 77°43'W.

Diagnosis.—Adult males with short spines on carapace, specially on anterolateral borders. The larger of the second pair of pereopods has a finger/palm length ratio of 2.0–2.3. Fixed finger bears a row of 4 to 11 tubercles along inner border.

Discussion

Since the revision of the Palaemonidae by Holthuis (1952), several new species of palaemonid shrimps have been described from the Amazon Region (Tiefenbacher 1978; Ramos-Porto 1979; Kensley & Walker 1982; Rodríguez 1982; Pereira 1985, 1986, 1991). The latter authors report species that, judged by the small brood and somewhat large size of the eggs, can be considered to have abbreviated larval development and a strictly land-locked freshwater habitat (Sollaud 1923a, 1923b; Shokita 1973, 1977, 1979; Gamba 1984; Magalhaes 1985, 1986, 1988; Chong & Khoo 1987a, 1987b). The Amazon Region has the largest number of strictly freshwater species (24) of palaemonids in the world (Pereira 1989). This agrees with the traditional view of taxonomists and biogeogra-

phers that consider the Amazon Region as an area with high endemism and diversity, probably as a result of both environmental heterogeneity and the long and complex paleogeographic history of the basin (Prance 1982). The upper Amazon Basin (east and northeast portion) was formed most recently during Pliocene times, whereas the middle basin was formed during the Cretaceous (Putzer 1984, Rodríguez & Pereira 1992). The complexity and long history of the basin led to the emergence of strictly freshwater palaemonids in at least four genera, *Macrobrachium*, *Palaemonetes* Heller, 1869, *Euryrhynchus* Miers, 1877, and *Pseudopalaemon* Sollaud, 1911, according to Magalhaes & Walker (1988), and Pereira (1989). The latter two genera are endemic to South America, and all four are strictly freshwater with abbreviated larval development.

An interesting argument arises when considering the phylogenetic history of the family (Pereira 1989). There is evidence of an early freshwater origin of this group because the closest relatives of the primitive genus *Euryrhynchus* occur in West African freshwaters (Powell 1976). This raises questions about the *tempo* and *mode* of evolution of the family and their invasion into the marine and freshwater habitat (Pereira 1989). Magalhaes & Walker (1988) considered abbreviated development as a derived condition. They concluded that there has been massive intergeneric convergence toward this type of life cycle in the Palaemonids mainly because of selective pressure to live in plankton-poor waters. However, a different point of view arises if the abbreviated development is considered the primitive condition. It could be argued that the life cycle with complete larval development, and acquired independently only by *Macrobrachium* and *Palaemonetes*, is the derived condition. The complete development eventually permitted these freshwater shrimps to be successful in colonizing more

productive environments like estuaries and mixohaline waters.

Acknowledgments

I wish to thank Dr. M. Reaka, Dr. R. W. McDiarmid, and Dr. C. Magalhaes for reviewing the manuscript. Special thanks to Dr. R. B. Manning for his advice and providing working space at the Smithsonian Institution, Division of Crustacea, during 1984–1988. Thanks to Dr. C. Magalhaes from INPA, Brazil, and Lic. H. Ortega from Universidad de San Marcos, Perú, for generously providing additional data on the species. Sheila Pauls kindly helped me in the final editing of this manuscript. Support for present research was provided by Consejo de Desarrollo Científico y Humanístico, Universidad Central de Venezuela.

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